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JAN 24 2007

REMARKS

Claims 1-5, 11-16, 19-21, 23-26 and 31-32 are pending herein.

1. Claim 1 was rejected under §112, second paragraph. Claim 1 has been amended herein to positively recite a step of restricting annealing to attend to this rejection. It is noted that a step of restriction annealing reads on complete elimination of any annealing step. In light of the amendments to claim, withdrawal of the §112, second paragraph rejection is respectfully requested.

2. Claim 22 was rejected under §112, second paragraph. Claim 22 has been canceled to attend to this rejection.

3. Claims 1-5, 11-13, 16, 19-20, 22-26 and 31-32 were rejected under §103 over Grabmaier et al. in view of Robinson et al. This rejection is respectfully traversed for the following reasons.

The PTO has relied upon Grabmaier et al. for a Czochralski growth process and on Robinson et al. for teaching that the boule formed by Grabmaier et al. would have been sliced into wafers. The PTO acknowledges that the references do not disclose a process aspect ratio not less than about 0.44, the process aspect ratio defined as the ratio of boule diameter to crucible inside diameter. However, the PTO reasons that such a process aspect ratio would have been obvious "to maximize the size of the crystal because larger crystals are more desirable." While Applicants do not dispute the general concept that larger crystals are generally desirable in the art, the art of record nowhere teaches or even remotely suggests "optimizing" process aspect ratio to achieve such large size crystals. Indeed, Applicants submit that larger crystals have not been formed in the art through a simple increase in process aspect ratio. Rather, such large sized crystals are formed through an increase in crucible size. In this respect, the attention of the PTO is drawn to the Rule 132 Declaration filed herewith.

The Rule 132 Declaration by Jennifer Stone-Sundberg, one of the co-inventors of the present application, provides details on the particular significance of the claimed process aspect ratio in the context of the claimed Czochralski method. To summarize briefly, one of ordinary skill in the art faced with improving crystal growth, while ensuring single crystallinity, homogeneity, reduction in twinning, etc., generally uses larger crucibles. As described, single crystal growth processes typically suffer from marked degradation in crystal quality as process aspect ratio increases. Such degradation is generally due to the relative small fraction of melt left behind when growing large crystals from a given melt, resulting in temperature instabilities in the melt and stoichiometric instabilities in the melt. The migrations to next generation large-size single crystals in the crystal growing art generally involves use of larger crucibles having reduced process aspect ratio, rather than increased process aspect ratio. The conclusory statement by the PTO that one of ordinary skill in the art would have used the claimed process aspect ratio simply to make larger crystals is not only supported by the art of record, and is also contrary to the approach one of ordinary skill in the art would take in forming large-sized crystals.

For at least the foregoing reasons, reconsideration and withdrawal of the §103 rejection over Grabmaier et al. in view of Robinson et al. are respectfully requested.

4. Claims 1-5, 11-13, 16, 19-20, 22-26 and 31-32 were rejected under §103 over Cullen et al. in view of Robinson et al. This rejection is respectfully traversed for the following reasons.

Applicants respectfully submit that the disclosure of Cullen et al. is no more relevant than the disclosure of Grabmaier et al. noted above. This rejection is deficient for the reasons advanced above, and for the reasons contained in the Rule 132 Declaration. It is noted that the PTO has additionally drawn attention to FIG. 1 of Cullen et al. for suggestion of a process aspect ratio greater than 0.44, since the single crystal boule 57 is depicted as allegedly being the size of the crucible 12. However, the PTO's reliance upon the dimensional accuracy of FIG. 1 is entirely misplaced. Indeed, the MPEP clearly states that examination cannot be based upon values derived from drawings that are not stated by the reference to be to scale. See MPEP §2126, which is quite clear on this issue, stating that when a reference does not disclose that drawings are to scale and are silent as to dimensions, arguments based upon measurements from the drawing features are of little value. MPEP §2126 goes on to state that proportions of the elements shown in a drawing cannot be relied upon unless the drawings are accompanied by appropriate disclosure that the drawings are to scale, or are otherwise intended to show accurate dimensionality. Looking particularly at FIG. 1 of Cullen et al., it can clearly be seen that merely the general shape of a boule 57 and the general shape of a crucible 12 are shown. It should be quite clear from the face of this document, that not only is the relative dimensionality between the two components not *intended* to be conveyed to one of ordinary skill in the art, but such relative dimensionality is *in fact* not conveyed to one of ordinary skill in the art. The drawings are simple illustrations of a crystal growth apparatus to show general components and process information, and are not equivalent to any sort of accurate engineering drawings.

Accordingly, for the reasons advanced above and because Cullen et al. do not even remotely suggest the claimed process aspect ratio as derived from its drawings, Applicants respectfully submit that the presently claimed invention would not have been obvious over Cullen et al. in view of Robinson et al. Accordingly, withdrawal of this §103 rejection is respectfully requested.

5. Claim 21 was rejected over the references addressed above in further view of Li. Applicants submit that Li fails to overcome the deficiencies of Grabmaier et al. and Cullen et al., and accordingly, withdrawal of this rejection is respectfully requested as well.

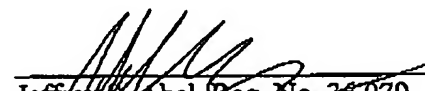
Applicants respectfully submit that the present application is now in condition for allowance. Accordingly, the Examiner is requested to issue a Notice of Allowance for all pending claims.

Should the Examiner deem that any further action by the Applicants would be desirable for placing this application in even better condition for issue, the Examiner is requested to contact Applicants' undersigned attorney at the number listed below.

The Commissioner is hereby authorized to charge any fees, which may be required, or credit any overpayment, to Deposit Account Number 50-3797.

Respectfully submitted,

Date 1/24/07


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